

An Examination of the Impact of San Diego's Digital Divide on Regional Economic Prosperity

A Follow-On Study Conducted on behalf of the
City of San Diego Science and Technology Commission
by the
San Diego Regional Technology Alliance (RTA)

based on
***San Diego's Digital Divide Revisited-
Approaching Digital Inclusion, But Disparities Persist***
released in October 2004 by the RTA for the Waitt Family Foundation



regional technology alliance : san diego
RTA@CONNECT

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ABOUT THE RTA

The San Diego Regional Technology Alliance (RTA) is a private 501(c)3 corporation, supported by private sector partnerships, grants and program revenues. The organization was established in 1993 by the State Legislature to administer tech commercialization grant funds and assist emerging technology and biotech companies. The RTA's mission has evolved over the decade in support of sustainable technology growth. Currently, the RTA provides direct business assistance to entrepreneurs and high-tech and biotech companies, programs to bridge the digital divide, and research and education to help shape public policy and forge effective collaborations.

Highlights of the RTA's Regional Impact

- 2,500 emerging growth companies worked with the RTA in some capacity between 2003 and 2004.
- During the same period, over 1,200 companies were represented at RTA's educational events – workshops and seminars.
- RTA's email newsletter reaches over 9,600 local tech company and community leaders and key decision makers weekly.
- RTA's website, featuring research, downloadable resources and information about community and professional services, attracts an average of 15,800 unique visitors per month.
- The RTA has produced 12 high tech, life sciences and economic development-related research publications.
- RTA's Community Technology Services program has helped over 30 community centers in the region's under-served neighborhoods gain technology access and plan for sustainability.
- Under a partnership with a local community college, the RTA helped to place over 60 students in computer technology career positions.

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This study is a product of the San Diego Regional Technology Alliance (RTA). The RTA is dedicated to providing assistance to San Diego's technology community through entrepreneurship programs and services, services to help community technology centers increase technology inclusion, and research to promote sustainable tech-based economic growth.

The RTA would especially like to acknowledge the Waitt Family Foundation for funding the primary study, which provided the infrastructure upon which this localized report has been built, and for their collaborative leadership in helping the San Diego community address critical technology issues.

The RTA thanks Susan Myrland, community technology consultant and member of the San Diego Science and Technology Commission, for her ongoing leadership in focusing the attention of our region on the persistence of the digital divide. The RTA also wishes to acknowledge Martha Dennis, Chair of the San Diego Science and Technology Commission, for making digital inclusion a priority, and for facilitating regional efforts to maintain a dialogue between all key stakeholders.

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EXECUTIVE SUMMARY

In keeping with its mission to support technology growth in the region, the RTA has been investigating the issues which surround the digital divide in San Diego for nearly ten years. In 2001, the RTA released a first-of-its-kind report on the extent of the digital divide in San Diego County, which exposed the degree to which we had significant gaps in technology access and awareness among people of various ethnic and economic groups. In 2004, with funding from the Waitt Family Foundation, the RTA revisited the same populations to see whether progress had been made towards creating a more equitable, computer and internet-literate community. In general, computer literacy and internet access in the region continued to be among the highest in the country, but the digital divide was found to have persisted for some ethnic and income groups, and in certain parts of the County.

At the request of the City of San Diego's Science and Technology Commission, the RTA has utilized the 2004 study data in order to profile the issues of the digital divide that might directly impact the City's ability to ensure continuing prosperity for all its citizens. Given the correlation between computer and internet literacy and the ability of people to qualify for jobs in the technology sector, the Commission was concerned that this issue was not being given sufficient consideration by City leaders.

While there has been significant growth in computer usage and internet access across the region as a whole since the RTA first undertook to examine this issue, in looking more narrowly at the digital divide within the City of San Diego, we have discovered a number of continuing issues which we hope will be a cause for action by City leaders.

Computer skills are a basic requirement for the City's workforce

- Of projected jobs within the industry clusters with the highest anticipated growth (Business Services, Communications, Defense and Transportation Manufacturing, Medical Services and Software and Computer Services) all but 4 of 25 occupations analyzed will require computer skills. There are many cluster jobs that do not require a bachelor's degree, but still require computer literacy.
- Our analysis found that 27,626 new jobs would be generated within the selected clusters by 2010. It is notable that wages in the selected clusters range from an average of \$18.50 to \$55.91 per hour.

The City of San Diego has pockets of citizens who lack workforce skills

- According to SourcePoint, over two-thirds of **residents over the age of 25 in four communities** within San Diego: Otay Mesa, Barrio Logan, San Ysidro, and Southeastern San Diego, **had only a high school education or less**. These communities also coincide with lowest levels of computer literacy.

Computer and Internet literacy levels are lagging in several sectors of the City

- The RTA found that 6.5% of respondents within the city of San Diego are either uncomfortable or have no experience with computers in general. 7.9% of San Diego respondents are either uncomfortable or have no experience with the Internet in general.

Comfort with computers and the Internet directly correlates with income

- The three lowest income brackets fall below the average for the city at large with regard to comfort with computers in general. Comfort with the Internet in general follows the same pattern.

Computer ownership is growing, but not uniformly, throughout the City

- In 2004, 83.6% of all San Diego residents owned a computer in their home, as compared to 71% in 2001. While computer ownership by Latinos is now 72.4%, up from 57% in 2000, they are the only ethnic group struggling to keep pace in San Diego.
- Respondents earning between \$20,000 and \$34,999 have the lowest rate of computer ownership. Home internet access, and broadband access in particular, are positively correlated with income.

Over 91% of households with computers have Internet access

- In 2004, of the San Diego residents who owned a computer, 91.2% had internet access in their homes, which represents a 2.4% increase since 2000. San Diegans who own computers access the internet through a broadband connection at a rate of 58.7% in 2004, representing an increase of 26.8% since 2000.

Without a home computer, access remains a challenge

- Of San Diegans who did not own a home computer, 29.6% indicated that they did not have access to a computer at all. For the majority of respondents, a lack of home ownership was balanced by computer access at work (52.6%), school (11.9%), the Public Libraries (6.1%), family/friends homes (3.8%) and Community Centers (0.4%). (Totals over 100% due to use of multiple access points reported by some respondents.)
- These percentages represent an improvement over 2000, where 42% of respondents without home computers reported that they had no access, or counted on friends or relatives (24%) or had access only at work (23%).
- The most respondents citing “no access” were Latinos (35.1%) and African-Americans (34.5%), and fewest came from Asian/Pacific Islanders (18.2%). People of color expressed a greater desire to increase their computer and Internet usage than whites.

The impact of computers and the Internet on people's lives varies by income and ethnicity

- People of color in general, and Latinos in particular, placed a higher value on the use of the computer for educational purposes or homework than whites.
- Respondents in the lowest income brackets demonstrated an increased interest in seeking health or medical information, learning about participation in the political process or using computers for educational or homework purposes than those in higher income brackets.
- The use of the computer to search for jobs or training was particularly important for respondents in the \$20,000 – 34,999 income bracket.

The City of San Diego risks a significant "opportunity cost," should it fail to consider the persistence of the digital divide to be an issue worthy of serious attention

- This study identified links between the employment provided by certain growing regional industry clusters and the City's ability to generate revenue, particularly through sales and property taxes paid by higher wage earners.
- If the City of San Diego chooses not to support efforts to close the digital divide, it risks missing the opportunity to help residents who are currently computer-illiterate enter into high-wage cluster employment.
- Based on the estimate of 13,974 City of San Diego residents that would not be able to enter into cluster occupations that require computer skills (see "Conclusion: The Opportunity"), **lost wage potential can amount to \$366,635,838 annually** based on the 2004 annual average entry-level wage of \$26,237 for technology sector jobs.
- Case studies from the cities of Atlanta and Seattle demonstrate that innovative approaches can work when City leaders take the initiative.

Recommended City actions

- The City could designate a Community Technology Officer, which has been an effective way in which other cities have provided a focal point for planning and action.
- Facilitate free wireless Internet access citywide. At the very least, the City could take a more active role in showcasing neighborhood access programs and helping to promote the existence of local "hot spots," so that the recurring monthly costs of internet access can become less of an obstacle.
- Support local community technology efforts and linkages between community technology centers (CTCs), libraries, and the city's community service centers, helping to bring awareness to the pathways between computer literacy, careers and the achievement of a high quality of life.
- Help the schools and public libraries address the fear factors still associated with computers and technology. This could be linked to efforts to engage the public in making better use of the City's website and online services.
- Support efforts to make home computers and internet access more affordable throughout the City.
- Continue to convene the Digital Inclusion Working Group (DIWG) as a high level forum for community technology issues and awareness, and provide full-time staff support.
- Incorporate technology access and training in existing CDBG funding guidelines, possibly expanding computer training in the South Bay, where the needs seem to be concentrated.
- Consider cable companies, utilities and corporations when seeking funding partners for these programs.

An Examination of the Impact Of San Diego's Digital Divide on Regional Economic Prosperity

A Follow-On Study based on

***San Diego's Digital Divide Revisited-
Approaching Digital Inclusion, But Disparities Persist***

INTRODUCTION

In 2001, the RTA released its report on the extent of the digital divide in San Diego County. The study was the first of its kind to be conducted in San Diego. The study uncovered significant gaps in technology access and awareness among Latinos, African-Americans, and other groups of color. With funding from the Waitt Family Foundation, the RTA updated the study in 2004, in an effort to answer the following questions:

1. As a societal challenge, how has the phenomenon of the digital divide changed in recent years? Has the discourse on the digital divide shifted, and if so, what are the new issues? What are the regional implications for San Diego?
2. What is the current extent of the digital divide in San Diego? How has it changed since 2000? What are the major digital divide issues that remain a challenge for San Diego?
3. What major efforts are currently underway to address the digital divide in San Diego? Have any of these efforts had a measurable impact thus far?

In addition to the study update, the RTA presents this separate follow-on study that will demonstrate the impact of San Diego's digital divide on the region's economic prosperity. The study will examine the region's labor demand and supply to determine how a lack of computer literacy skills factors into the regional economy's skills gap – thereby impacting the regional population's ability to enter into high wage employment. Regional economic prosperity (which is a reflection of standard of living and quality of life) has traditionally been measured in terms of real per capita income and purchasing power. This study will examine the degree to which a lack of computer literacy (i.e., the digital divide) undermines regional economic prosperity.

This follow-on study makes use of four sources of data. In addition to the Waitt Family Foundation study, the RTA has drawn upon the San Diego Workforce Partnership's *Path to Prosperity* report, released in 2003. This study utilizes demographic and cluster-based employment forecasts to describe the outlook for San Diego's workforce within the next ten years. Survey data will be utilized together with the above sources of data to create profiles of geographic sub-regions within San Diego. Finally, this study looks at other local governments' digital divide endeavors as well as recommendations from previous studies to determine what type of activities the City of San Diego can engage in to address its digital divide.

The RTA undertook a brief review of the literature in an effort to find a methodology that quantitatively illustrates the impact of the digital divide on a region's economic prosperity. The RTA was unable to find such a methodology. Therefore, the RTA's analysis for the City of San Diego Science and Technology Commission may be unique in its approach to this issue.

In the 2004 Digital Divide Revisited study, we learned the following key facts:

- While computer ownership in San Diego County increased between 2001 (74%) and 2004 (81%), and home Internet access in San Diego County increased between 2001 (67%) and 2004 (90%), the progress was not evenly distributed throughout the region.
- In 2001, Hispanics/Latinos had the lowest rate of computer ownership; this remains the case in 2004. In addition, their ownership rate remains below the average for all ethnic groups. Although Latinos comprise 28% of San Diego's general population, they make up 40% of the "unwired" population.
- In 2001, South County residents had the lowest rate of computer ownership; this is still the case in 2004. South County residents' rate of computer ownership also remains below the average rate for all sub-regions.
- General computer and internet literacy appears to be highest among San Diego City and North Coastal residents, African Americans, 18 to 44 years olds, and people with annual household incomes of \$35,000 or higher.
- Cost is still a factor in discouraging home ownership of computers.
- The importance of public computer/Internet access points (such as public libraries and community technology centers) is underscored by the fact that 7% of San Diegans do not have computer access at home or anywhere else; this deficit is even more pronounced in certain sub-groups.
- The workplace was the most common location for computer access outside the home, followed by schools and public libraries – but people with lower education levels have substantially less access at work (28% compared to the overall average of 49%).
- The top 3 purposes for using a computer were e-mail, educational purposes or homework, and work-related tasks. People of color, however, (Latinos, African-Americans, and Asians/Pacific Islanders) typically placed more importance on using the computer to find information on laws and policies that affected them, educational purposes or homework or in searching for jobs or training than Whites.

The final recommendations from that study asked that the leadership of the San Diego region:

- Encourage and support community technology programs in South County.
- Coordinate outreach efforts to make San Diegans aware of the opportunities for computer access and training that are available to them.
- Continue to promote and support computer ownership and broadband Internet access.

DEFINITION OF THE DIGITAL DIVIDE AND ITS SIGNIFICANCE

The term “digital divide” is believed to have originated in the Clinton administration, between 1995 and 1997. It has been commonly known as a term to describe the gap between those populations that have access to computers and technology and those populations that do not. The term received national attention in 1999 with the release of a report from the National Telecommunications and Information Administration (NTIA) of the U.S. Department of Commerce entitled *Falling Through the Net: Defining the Digital Divide*. The report revealed disparities in rates of computer and Internet access between Whites and people of color. In the NTIA report and in the years since, the digital divide has commonly been measured by the yardsticks of computer ownership and home Internet access.

However, the federal government, mainstream media, and other institutions have begun to rethink the digital divide and question whether or not the divide even exists or if it is still an issue. A shift in perspective at the federal level can be witnessed in the NTIA’s computer use reports over time: in 1999 and 2000, the reports were titled *Falling Through the Net*, implying that there is a population of Americans that are being left behind by technology. The report that followed in 2002 was titled *A Nation Online: How Americans are Expanding Their Use of the Internet*. The report and its conclusions represented a fundamental shift in the federal government’s priorities, leading those who only read *A Nation Online* to believe that a digital divide no longer exists or is negligible. This shift is also reflected in a noticeable decrease in media coverage regarding this issue. What little coverage exists often points to how the divide has allegedly closed, or that it was actually never there at all, as evidenced by an article in *BusinessWeek* in August, 2003, titled “The Digital Divide That Wasn’t.”¹ The impact of this shift in public perception is significant. For example, reports such as *A Nation Online* have been used as justification for continual efforts to eliminate federal funding programs established by the Clinton administration for community technology initiatives, such as the U.S. Department of Commerce’s Technology Opportunities Program (which was eliminated in 2004) and the U.S. Department of Education’s Community Technology Centers Program.

In response, many researchers and community advocacy organizations have challenged the definition of the digital divide, and have contested the perception that the divide no longer exists. Even the term “digital divide” has become passé according to some experts. Traditional notions of the digital divide, particularly those presented by mainstream media and the federal government, define disparities by focusing on access to computers and the Internet. This has typically been measured by home computer ownership. Although home computer ownership may be increasing among all segments of the population, computer and Internet technology still may not benefit everyone equally. In *Reconceptualizing the Digital Divide*, Mark Warschauer maintains that digital inclusion efforts must focus on social inclusion as a goal in increasing computer and Internet use among all populations. Social inclusion

“refers to the extent that individuals, families, and communities are able to fully participate in society and control their own destinies, taking into account a variety of factors related to economic resources, employment, health, education, housing, recreation, culture, and civic engagement.”²

¹ Amey Stone, “The Digital Divide That Wasn’t,” *BusinessWeek*, August 19, 2003.

² Mark Warschauer, “Reconceptualizing the Digital Divide,” *FirstMonday*, June 2002.

With social inclusion as a goal, previously attempted solutions that involved increasing home computer ownership have proven to be inadequate in closing the digital divide. Whereas prior examinations of the digital divide focused on home computer ownership, questions now shift to the following:

Literacy

Do individuals possess the skills necessary to utilize the opportunities provided by computer and Internet technology?

Content

Can individuals find online content that is accessible, relevant, and appropriate for their life situations?³

Uses and Awareness

What opportunities are available to individuals through computer and Internet technology? Are people aware of these opportunities, and are they able to take advantage of them to improve their quality of life?

To the extent possible, the San Diego Regional Technology Alliance attempted to take these questions into consideration in assessing the extent of San Diego's digital divide. Moreover, as it specifically impacts the City of San Diego, we are attempting to call attention to the long-term consequences of failing to address this issue and to alert public policymakers to the potential consequences of benign neglect towards the economic vitality of America's Finest City.

³ For more information about relevant online content, visit www.contentbank.org, a website that recommends websites that are particularly suited for low-income or underserved communities.

THE SIGNIFICANCE OF CLUSTERS AS A MEANS OF ANALYSIS

Industry clusters are defined as groups of interrelated businesses that drive wealth creation in a region. Their markets are not limited by the size of the local economy; rather, experts such as Harvard economist Michael Porter have pointed to clusters' power to drive regional wealth creation because they are export-oriented. Furthermore, cluster firms are of particular interest to regional economic developers because they have the ability to pay high wages.

Since its inception in 1993, the San Diego Regional Technology Alliance has championed the use of industry clusters as a valuable framework for economic development analysis and policy. With funding from the Economic Development Administration of the United States Department of Commerce and the City of San Diego, the RTA and SANDAG/SourcePoint initiated the first studies of San Diego's sixteen industry clusters in the late '90s. With the departure of middle-income jobs due to defense downsizing, industry cluster analysis provided a useful method of identifying the sectors that would drive economic prosperity within San Diego.

Industry cluster analysis has since become a preferred regional economic development tool in San Diego. In recent years, a coalition of economic development entities including the RTA, the San Diego Regional Economic Development Corporation, SANDAG/SourcePoint, San Diego State University, and the San Diego-Imperial Counties Labor Council, led by the San Diego Workforce Partnership have used the clusters as a backbone for regional workforce development strategies.

San Diego's industry clusters are therefore crucial as a means of analysis for this study, because they provide the framework for analysis of regional economic prosperity, and the factors that influence it. They will serve as a basis for analyzing future labor supply and demand issues relative to the City of San Diego Science and Technology Commission's digital inclusion efforts.

What are Clusters?

The concept of clusters has been vital to our understanding of the San Diego economy, particularly since defense conversion in the early to mid 1990s. At that time and ever since, the City of San Diego and organizations such as the San Diego Regional Technology Alliance, the San Diego Association of Governments (SANDAG), the San Diego Workforce Partnership, and the San Diego Regional Economic Development Corporation, began focusing on traded clusters, for their potential to fill in the gap created by the massive loss of middle-wage jobs lost during defense conversion.

Traded clusters are defined as

“complementary, competing, and interdependent industries that drive wealth creation in the region through the export of goods and services. In addition to exporting, companies in traded clusters exhibit two other distinct characteristics: strong business transaction relationships and close geographic proximity.”⁴

⁴ SANDAG, Science and Technology: The Key to Creating Prosperity. (San Diego: San Diego Association of Governments, 2004), 7

Particularly among technology clusters in San Diego, jobs within traded clusters tend to pay higher wages than non-cluster jobs.

Sixteen traded clusters have been identified in San Diego, but of these, six clusters are the focus of this report:

- Business Services
- Communications/Telecommunications
- Defense and Transportation Manufacturing
- Medical Services
- Software and Computer Services
- Visitor Services

Each cluster in San Diego is defined by Standard Industrial Classification (SIC) codes. SANDAG is currently in the process of redefining the clusters through the use of the North American Industry Classification System (NAICS) codes.

A description of each of the above clusters, as currently defined by SANDAG, follows:

Business Services

The business services cluster includes sectors that provide a variety of professional services to local business establishments, including management, legal, and personnel supply services. Many of today's business service sectors, such as intellectual property law, catalog publishers, and computer facilities management, are developing specialized skills to better serve the region's clusters.

Communications (Telecommunications)

The communications cluster includes sectors primarily engaged in researching and manufacturing communications-related products. The cluster also includes sectors that provide point-to-point communications services such as cellular and digital phone services. Examples of cluster products include cellular and digital phones, wireless devices and the technology therein, including encryption devices.

Defense and Transportation Manufacturing

The defense and transportation manufacturing cluster includes sectors engaged in manufacturing or assembling aircraft, ships, boats, and defense related products such as guided missiles. As a result of decreased defense spending in the early 90s, some cluster businesses were forced to diversify their product lines to include commercial and high technology goods and services.

Medical Services

The medical services cluster includes sectors primarily offering health services to the general public through hospitals, medical facilities, and offices.

Software and Computer Services

The local software and computer services cluster has its roots in the defense industry. When defense spending decreased in the early 90s, software firms shifted their focus towards the commercial market and the cluster has now linked itself to most of the other technology clusters, providing products, services, and support to a wide range of

companies. The cluster provides services such as computer programming, systems design and engineering, prepackaged software, software development, and computer training.

Visitor industry Services

The visitor industry services cluster includes sectors such as hotels and motels, restaurants, travel agencies, and car rental companies. The largest employers in the cluster are hotels, other lodging places, and restaurants.

ANALYSIS OF LABOR DEMAND

In recent years, the San Diego Workforce Partnership has taken a leadership role in efforts to understand and to help close the gap between regional labor market supply and demand. In collaboration with partners such as the RTA, SANDAG/SourcePoint, San Diego State University, and the San Diego-Imperial Counties Labor Council, the Workforce Partnership has produced a number of studies that examine the region's skill shortages. In addition, SANDAG has continued to provide employment and wage data on the region's industry clusters. This data provides a means of analysis for the region's current and future labor demand.

The RTA has examined this data to determine the significance of computer skills to the cluster occupations that are projected to be most in demand within the next five to ten years. This analysis determines the projected number of new jobs in selected clusters, and also looks at other requirements per occupation, such as education or experience, and the wages associated with those jobs.

To analyze labor demand in San Diego, it is useful to examine occupations within those clusters that are projected to have the greatest future growth in employment. For projected employment in all clusters to 2030, please see Appendix A. The following clusters were selected for analysis due to relatively high employment growth between 2004 and 2010 as projected by SANDAG:⁵

Cluster	Number of New Jobs, 2004-2010	Average Hourly Wage, 2000
Business Services	11,944	\$18.50
Communications	1,822	\$55.91
Defense & Transportation Manufacturing	1,750	\$25.53
Medical Services	7,726	\$19.08
Software and Computer Services	4,384	\$38.15
Total New Jobs in Selected Clusters:	27,626	Cluster Average \$31.44

Within each of the above clusters, occupations with the greatest projected future growth were analyzed to determine the significance of computer skills to those occupations. The analysis included the following data:

1. Employment growth among selected cluster occupations
2. Education and skill requirements for above occupations
3. Total number of jobs and wages associated with above occupations

As shown above, the analysis found that 27,626 new jobs would be generated within the selected clusters by 2010. It is notable that wages in the selected clusters range from an average of \$18.50 to \$55.91 per hour.

Five occupations were analyzed per cluster, for a total of twenty-five occupations. The five occupations analyzed from each cluster were chosen based on high projected future employment growth. Of the twenty-five occupations, there were only four that did not require computer skills: electrical and electronic assemblers, plumbers/pipefitters/steamfitters, dental assistants, and physical therapy assistants. Computer skills were necessary for the other twenty-one occupations within the selected

⁵ SANDAG 2030 Regionwide Forecast, December 2003.

clusters. Based on this finding, it is reasonable to presume that a majority of jobs within these clusters also require computer skills.

It is also worth noting that among the twenty-five cluster occupations analyzed, eleven required a high school diploma or less, while eleven required a bachelor's degree. One may be inclined to assume that it is a college education which prepares someone for employment in the fast growing cluster occupations. However, this analysis demonstrates that this is not necessarily the case. It is computer literacy is essential in today's workplace. There seem to be many cluster jobs that do *not* require a bachelor's degree but still require computer literacy.

(A detailed listing of occupations considers follows).

CLUSTER OCCUPATIONAL ANALYSIS				
	Occupation	Projected Total Annual Openings, 2001-08	Requires Computer Skills?	Education Requirements
Business Services	Accountants and Auditors	311	yes	Bachelor degree
	Paralegal Personnel	57	yes	Associate degree
	Sales Agents	402	yes	Bachelor degree
	Bill and Account Collectors	201	yes	High school diploma
	Financial Managers	228	yes	Bachelor degree
Communications	Telecommunications Equipment Installers and Repairers	64	yes	Bachelor degree
	Electrical and Electronic Engineers	77	yes	Associate degree
	Customer Service Representatives	668	yes	Bachelor degree
	Electrical and Electronic Assemblers	162	yes	High school diploma
	General Office Clerks	947	yes	Bachelor degree
Defense and Transportation Manufacturing	Computer Hardware Engineers	35	yes	Bachelor degree
	Electricians	315	yes	High school diploma
	Plumbers, Pipefitters, Steamfitters	114	no	High school diploma
	Electrical, Electronic Engineer Techs	104	yes	Bachelor degree
	Mechanical Engineers	94	yes	Bachelor degree
Medical Services	Registered Nurses	817	yes	Associate degree
	Dental Assistants	182	no	High school diploma
	Physical Therapy Assistants and Aides	68	no	Associate degree
	Physical Therapists	82	yes	Bachelor degree
	Medical Assistants	288	yes	High school diploma
Software	Desktop Publishers	38	yes	High school diploma
	Network Professionals	185	yes	Bachelor degree
	Computer Support Specialists	552	yes	High school diploma
	Systems Analysts	65	yes	Bachelor degree
	Public Relations Managers	48	yes	Bachelor degree
Visitor Services	Concierges	18	yes	High school diploma
	Restaurant Cooks	345	no	High school diploma
	Travel Agents	45	yes	High school diploma
	Food Service Managers	52	no	High school diploma
	Food Preparation Workers	314	no	High school diploma

ANALYSIS OF LABOR SUPPLY

To analyze the ability of San Diego's labor supply to enter high-wage jobs within the next five to ten years, the RTA draws upon two sources of data:

A Path to Prosperity: Preparing Our Workforce

In early 2003, the San Diego Workforce Partnership and SourcePoint released its study of labor shortages and skill deficiencies in San Diego. This study utilizes demographic and cluster-based employment forecasts to describe the outlook for San Diego's workforce within the next ten years.

The *Path to Prosperity* examined labor market imbalances throughout the region. These imbalances are particularly useful in identifying at-risk communities throughout the city, or those communities that may be most in need of government intervention with regard to digital divide-related issues and workforce development. The study's findings with regard to city of San Diego follow.

RTA 2003 Digital Divide Survey of San Diego Residents

The RTA surveyed San Diego residents to determine the extent to which residents have access to or own computers, and are computer literate. The RTA has identified key findings relative to the city of San Diego.

Data from the Workforce Partnership/SourcePoint study and the RTA survey of San Diego residents has been examined and compared to determine the characteristics (including level of computer literacy) of the population that will be least able to enter the region's high-wage jobs within the next ten years.

Proportion of Workers with Low Educational Attainment, 1990

SourcePoint determined which communities within San Diego county have high proportions of residents over the age of 25 that have only a high school education or less, in an effort to identify pockets of low-skill populations most in need of workforce development. Over two-thirds of residents over the age of 25 had only a high school education or less in four communities within San Diego: Otay Mesa, Barrio Logan, San Ysidro, and Southeastern San Diego. The study also found that there are eleven training providers located within these communities. These training providers may enable community residents to not only increase their education levels in general, but specifically may serve as vehicles for computer and Internet training as well.

Proportion of Jobs with Mean Wage Less than the Regional Living Wage, 2000

SourcePoint identified communities where a large proportion of the employment earned less than San Diego's 2001 living wage of \$11.58 per hour. Four communities that had the largest proportions of low-wage employment were located within the city of San Diego: Mission Bay, Mission Beach, Ocean Beach, and Pacific Beach. This is presumably due to a large concentration of jobs in the visitor services industry in these areas.

2000 Labor Force Participation Rates

SourcePoint identified the labor force participation rates for communities throughout the region. The labor force participation rate is defined as the proportion of the working-age population that is either working or currently looking for work. Two communities in the city of San Diego had the lowest labor force participation rates in the entire region: San Ysidro and Southeastern San Diego. Labor force participation is significant because it is a measure of both the employment opportunities and the barriers to employment in any given community. Barriers discussed in the study include teen pregnancies, lack of affordable childcare, and relatively high school dropout rates.

In examining data from the RTA's survey of San Diego residents, those results concerning computer literacy are of particular interest with regard to labor supply. A discussion of specific computer literacy findings by ethnicity and income follows in the City of San Diego Profiles section. In this section we will focus our analysis on those city residents that may be considered to have low levels of computer literacy.

For the purpose of this analysis, computer literacy is measured by comfort with performing specific tasks on the computer or Internet. Survey respondents were asked about their comfort level with such tasks, to which they could respond "very comfortable," "somewhat comfortable," "somewhat uncomfortable," "very uncomfortable," and "no experience." This analysis focuses on those city residents who responded "somewhat uncomfortable," "very uncomfortable," and "no experience" to specific tasks; these respondents can be considered to have low levels of computer literacy. Tasks were then grouped into basic and advanced categories for purposes of comparison. Please see Methodology for information on how tasks were classified.

The survey found that 6.5% of respondents within the city of San Diego are either uncomfortable or have no experience with computers in general. 7.9% of San Diego respondents are either uncomfortable or have no experience with the Internet in general. As might be expected, more San Diego respondents are uncomfortable with advanced computer and Internet tasks, as shown in the table below.

San Diego Residents Not Comfortable with Computer and Internet Tasks	
Using a computer in general	6.5%
Using the Internet in general	7.9%
Basic computer tasks	11.2%
Advanced computer tasks	30.9%
Basic Internet tasks	13.9%
Advanced Internet tasks	29.8%

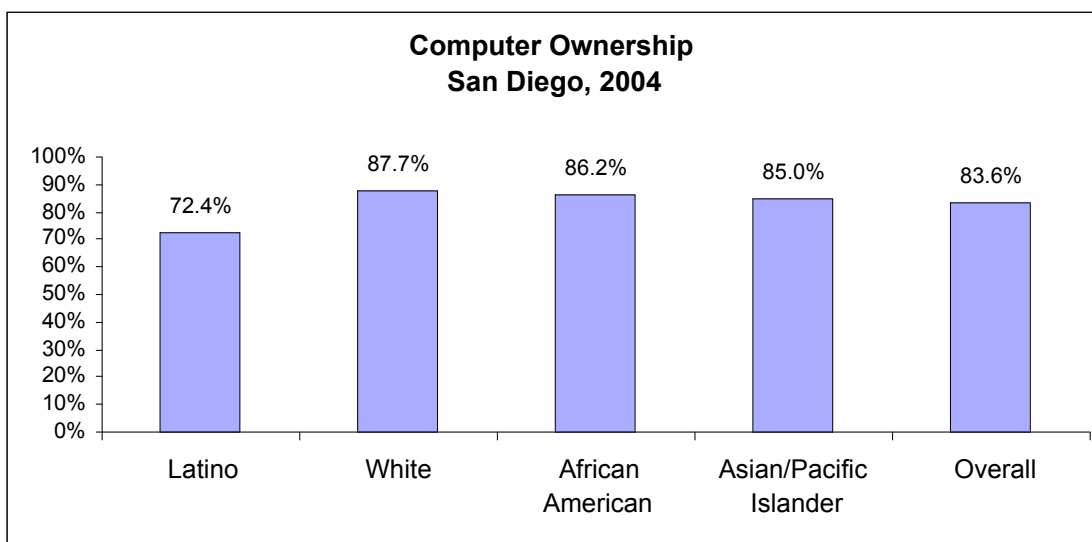
Respondents who answered "no experience" when asked about specific tasks are also of particular interest. Advanced computer tasks had the highest amounts of "no experience" responses. Specifically, using a spreadsheet program and creating a flyer with graphics received the greatest amount of "no experience" responses, with 12% and 13% respectively.

CITY OF SAN DIEGO PROFILES

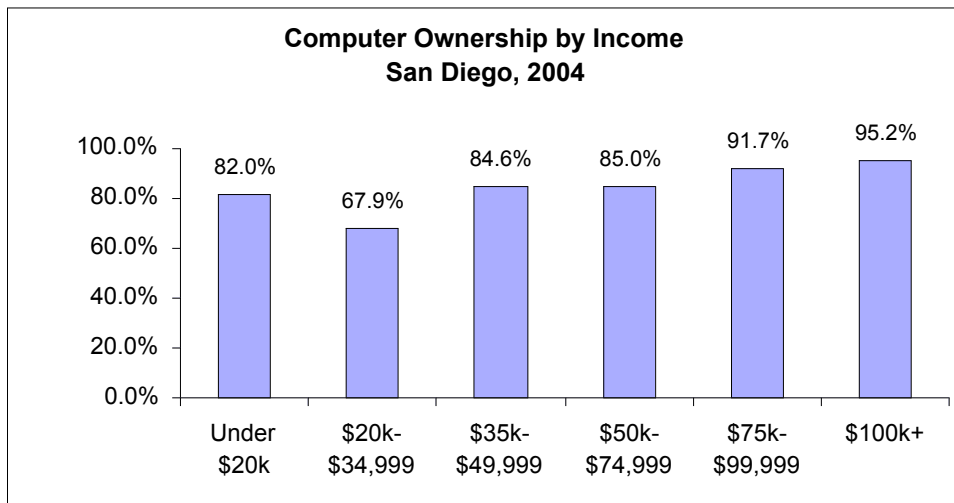
The following profiles provide an in-depth examination of residents within the city of San Diego. This analysis includes selected geographic areas within the city to determine levels of digital inclusion, as well as other demographic and economic variables such as race, and income. This data is derived from the RTA's survey of San Diego county regarding computer and Internet usage and literacy. Data from the RTA's survey are compared to findings from the City's 2000 digital divide survey for descriptive purposes only – because the RTA 2004 survey and the City's 2000 survey did not employ the same survey tool nor the same sample parameters, comparisons between 2000 and 2004 are provided only for basic comparison and should not be strictly considered.

Computer Ownership

In 2004, 83.6% of all San Diego residents owned a computer in their home. The previous study conducted by the City of San Diego, *The Digital Divide: A Call to Action* found a computer ownership rate of 71% in 2000. Latinos are the only ethnic group struggling to keep pace in San Diego; their computer ownership rate is 72.4%. The Latino community, although lagging in computer ownership, appears to have experienced a large increase in the ownership rate since 2000. The 2000 study conducted by the City of San Diego found a 57% computer ownership rate among Latinos.



Respondents earning less than \$20,000 per year have a higher ownership rate (82%) than those in the next higher income bracket. Respondents earning between \$20,000 and \$34,999 have the lowest rate of computer ownership. Presumably, this is due to a large number of students with incomes less than \$20,000 per year. Students often own computers at home.

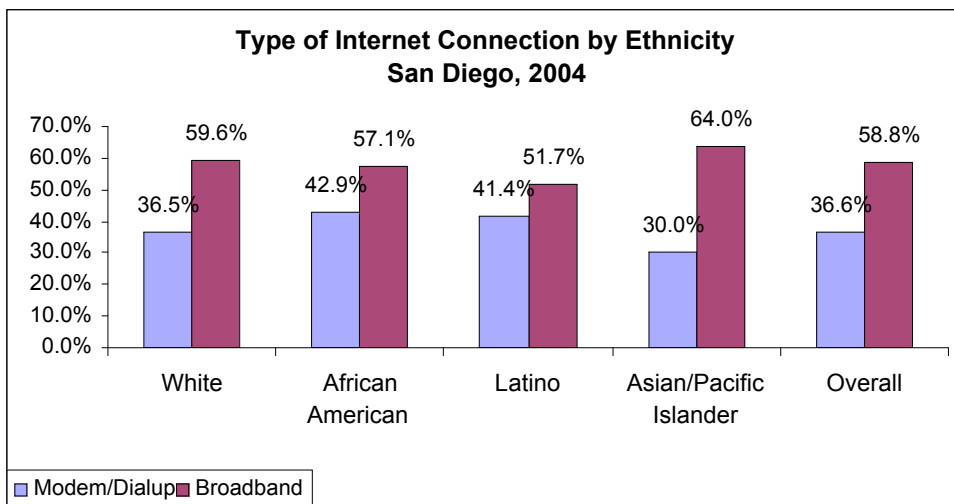


Internet Access and Type of Connection

In 2004, of the San Diego residents who own a computer, 91.2% have internet access in their homes. Of this connected population, 36.6% cited a dial-up modem as their access method, 40.8% used a cable modem, and 17.9% accessed the internet through a DSL connection. In other terms, San Diegans who own computers access the internet through a broadband connection at a rate of 58.7%.

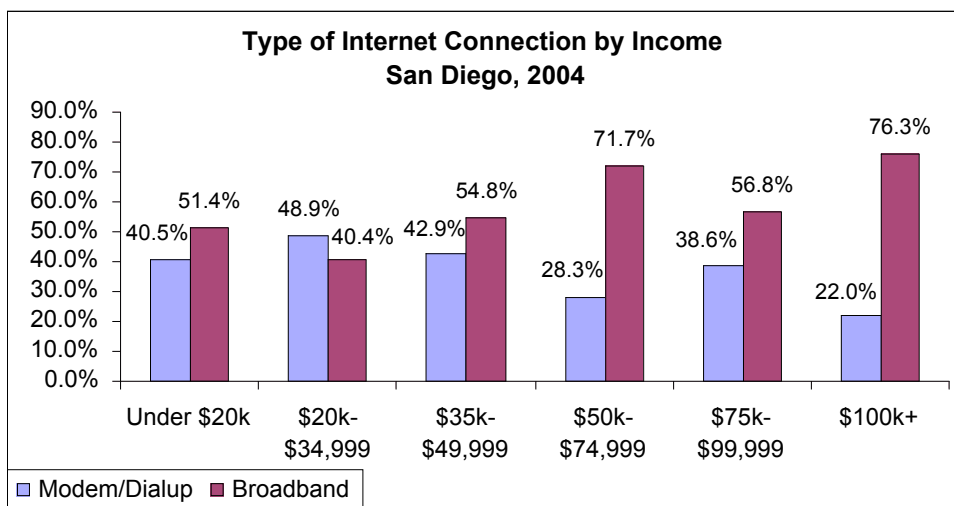
In 2000, 88.8% of computer-owning San Diego residents had internet access in their homes. Of that population, 64.6% accessed the internet through a dial-up modem, and 31.9% used a broadband connection.

Both the African-American and Latino communities have lower-than-average broadband access and higher-than-average dial-up modem utilization than the rest of San Diego. Both African Americans and Latinos appear to have experienced increases in broadband access since 2000. The Asian/Pacific Islander community has the highest level of broadband internet access, at the rate of 64.0%.



Home internet access, and broadband access in particular, are positively correlated with income. A higher number of broadband connections in the lowest income bracket as compared with the last bracket is again attributable to a large proportion of students with annual household incomes of less than \$20,000.

Given the increasing availability of broadband access, web content has become more complex. Therefore the internet experience of those using dial-up will become increasingly more difficult, which can add another dynamic to digital-divide related issues.



Computer Literacy as Measured by Comfort with Specific Tasks

Mean scores are employed when examining computer literacy. Survey respondents were asked about their comfort level with specific computer or Internet-related tasks, to which they could respond “very comfortable,” “somewhat comfortable,” “somewhat uncomfortable,” “very uncomfortable,” and “no experience.” Answers were coded as follows:

Very comfortable	+4
Somewhat comfortable	+3
Somewhat uncomfortable	+2
Very uncomfortable	+1
No experience	0

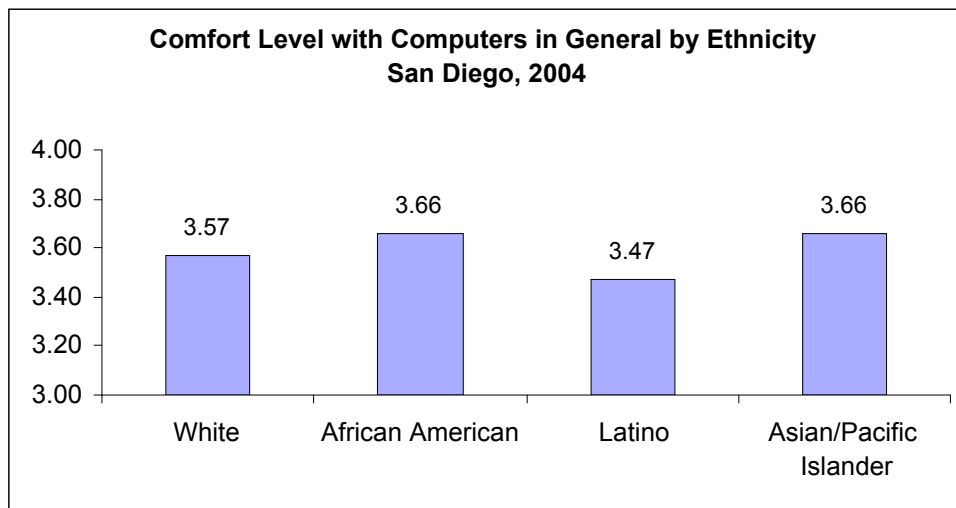
Responses were aggregated to determine the average or “mean” score for each task. A higher mean score (closer to 4) indicates a higher level of literacy, whereas a lower mean score (closer to 1) indicates a lower level of literacy.

San Diego residents have a mean score of 3.59 when asked about their comfort with using the computer in general. With basic computer skills, residents scored 3.52, and with more advanced skills, residents scored 2.58.

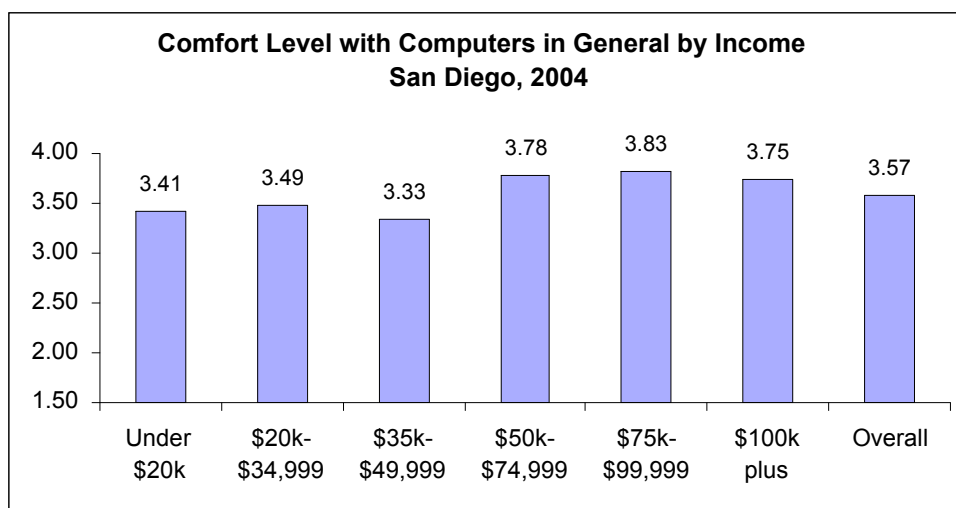
Levels of comfort with skills involved in utilizing the internet follow the same pattern. Comfort with using the Internet in general scored 3.56, basic internet skills scored 3.42, and more advanced internet skills scored 2.88.

There is an obvious disparity in comfort with computer skills in general between Latinos and other ethnic groups within San Diego. With a 3.47 mean score as a measure of comfort level with computer usage, Latinos are the lowest scoring ethnicity. The overall comfort

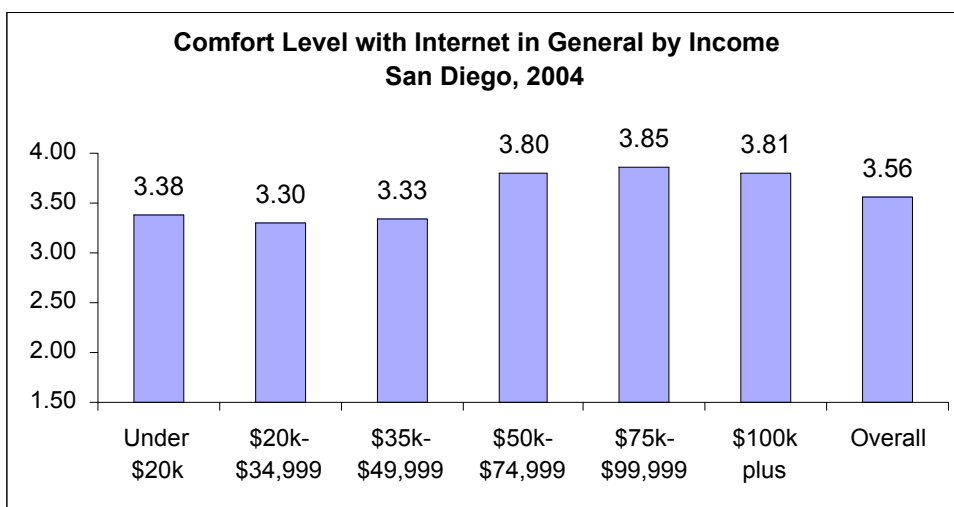
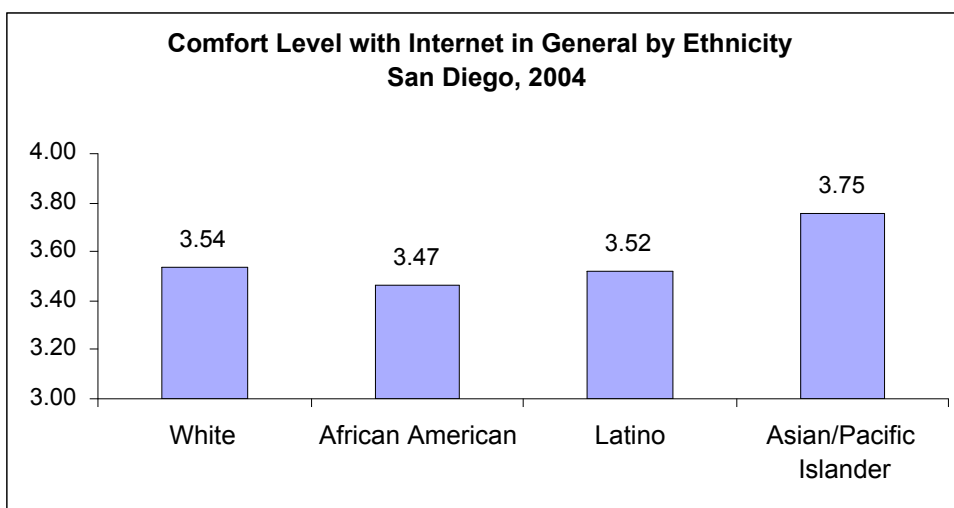
level is 3.57, and both of the other groups of color (African-American, Asian/Pacific Islander) score 3.66. The lower than average comfort level with general computer skills can probably be attributed in part to lower levels of computer and internet experience due to limited access.



The three lowest income brackets fall below the average for the city at large with regard to comfort with computers in general. Comfort with the Internet in general follows the same pattern.



Levels of comfort with skills involved in utilizing the internet followed a different pattern. Comfort with using the Internet in general scored 3.56 overall, and African-Americans were the lowest scoring ethnic group, which scored 3.47. The highest scoring group were Asian/Pacific Islanders, who scored 3.75.



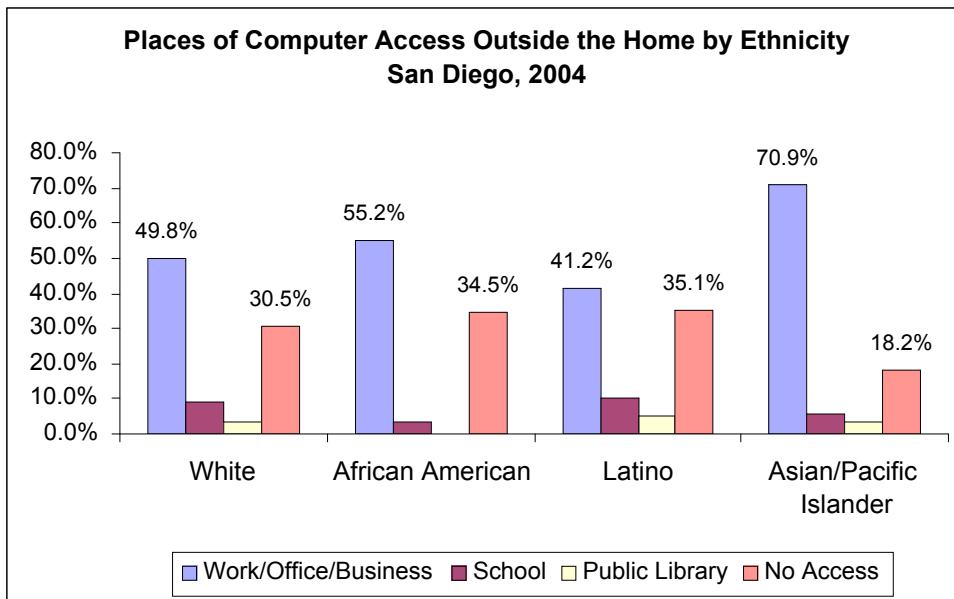
Locations for Computer Access

San Diegans were asked about where they use the computer outside of the home. “Work” (52.6%) and “No access” (29.6%) were the most prevalent answers. Other responses included “School” (11.9%), “Public Library” (6.1%), “Family/friends home” (3.8%) and “Community Center” (0.4%)

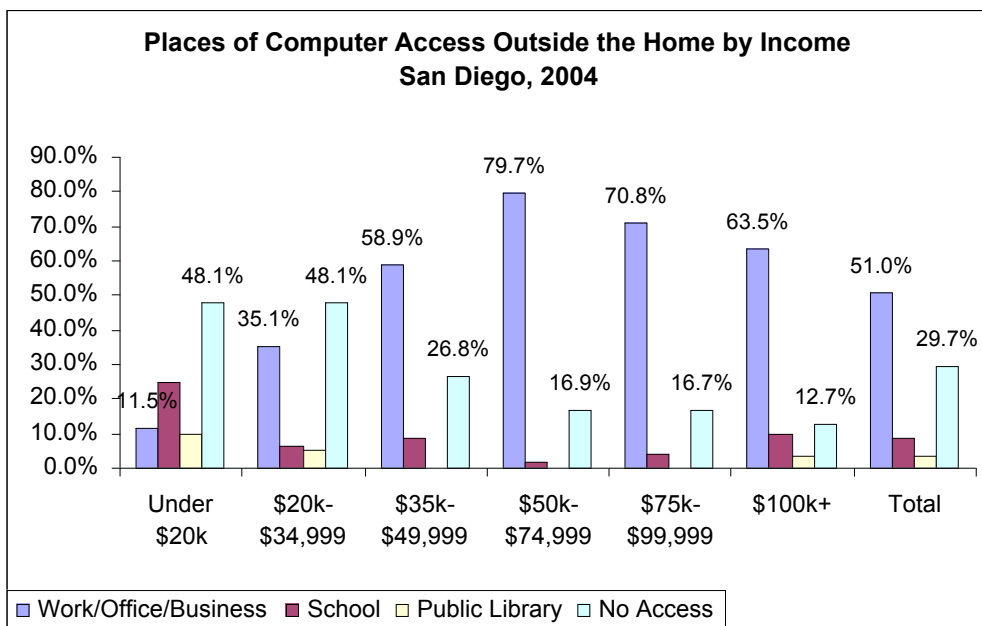
In 2000, respondents without home computers were asked where they utilized computers. The most frequent responses included “No Access” (42%), “Friend/Relative” (24%), and “Work” (23%).

The most “No Access” responses came from Latinos (35.1%) and African-Americans (34.5%), and the least responses of “No Access” came from Asian/Pacific Islanders (18.2%).

As was witnessed in the entire San Diego region at large, Latinos appear to utilize schools and public libraries as points of computer access outside the home at a higher rate than other ethnic groups. This finding is significant because it signals the importance of funding for schools and libraries in order to continue providing an access point for those segments of the population have the least access to computers and the Internet.

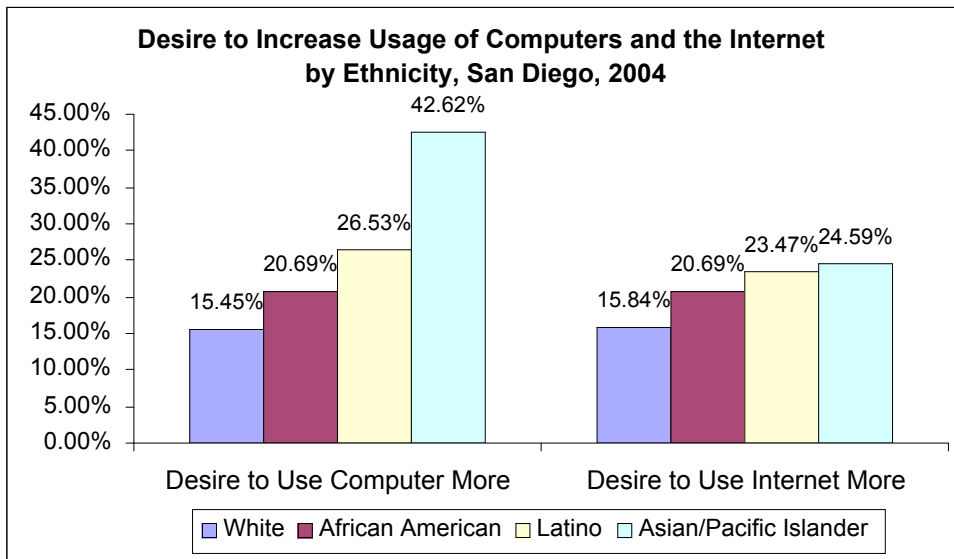


A few income trends are evident in locations for computer access outside the home. First, not having any access to computers outside the home is associated with the lowest income brackets. Second, the frequency of respondents stating work as a location for computer access outside the home increases with income. Finally, schools and public libraries are particularly important locations for computer access outside the home for the lowest income brackets.

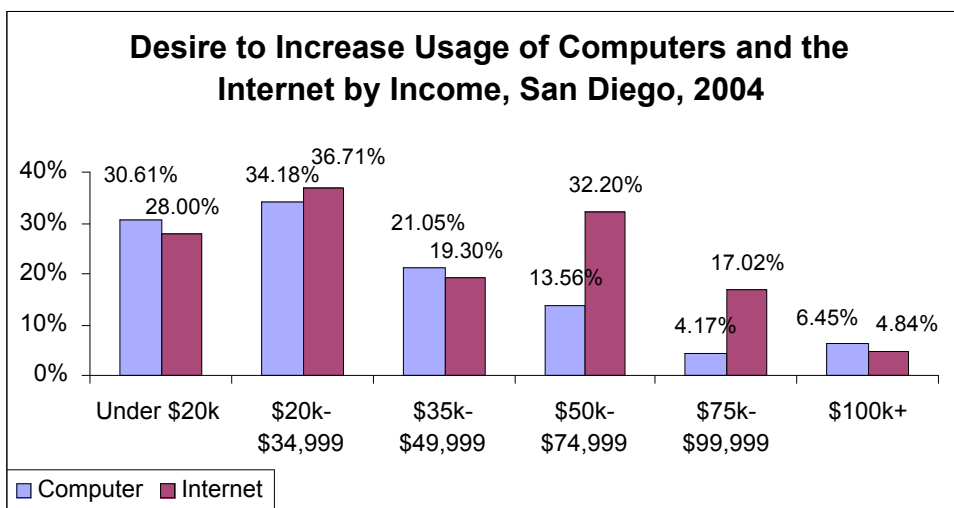


Desire to Increase Computer or Internet Use

Most San Diego residents responded that they would not want to increase their usage of the internet. 79.9% expressed no desire to increase their usage of computers, and 77.8% expressed no desire to increase their usage of the internet. However, a higher desire to increase computer and Internet usage can be seen among people of color as compared to whites. It is significant that Latinos in particular have a greater desire to use computers and the Internet, but appear to be the ethnic group that may have the least access to computers and the Internet.



Among respondents who want to utilize computers and the Internet more than they currently do, those in the \$20,000 to \$34,999 income bracket expressed the most desire to increase their usage. It is notable that the populations that most would like to increase their computer and Internet usage are those who also have the least access to computers and the Internet.



Differences in Uses

A mean score range of 0 to 2 was employed to gauge the importance of computer and internet related tasks among San Diego residents. A score of 0 indicates no importance, and a score of 2 indicates that the tasks are vital in computer usage. The highest rated task in San Diego was “e-mail,” with a score of 1.65. This mirrors results found in the City study conducted in 2000, in which respondents were asked whether or not they had used computer or internet technology tools within the last year. The highest-ranking tool utilized was email, with 93% of respondents answering that they had utilized it within the last year. The lowest rated task in 2004 was online chatting, which scored 0.52.

Priority of Tasks by Sub-Region San Diego, 2004	
<i>Task:</i>	San Diego City
<i>Email</i>	1.65
<i>Educational purposes or homework</i>	1.37
<i>Travel information/arrangements</i>	1.29
<i>Do work related tasks</i>	1.28
<i>Gather information about hobbies/ personal interests</i>	1.19
<i>Gather information about products and services</i>	1.17
<i>Keeping up to date on current events</i>	1.07
<i>Managing your finances</i>	0.99
<i>Getting health or medical information</i>	0.99
<i>Purchase products or services</i>	0.99
<i>Find information about laws/ policies that affect you</i>	0.94
<i>Search for jobs or training</i>	0.91
<i>Entertainment or sports</i>	0.87
<i>Create Graphics</i>	0.81
<i>Participate in or learn about community activities</i>	0.81
<i>Participate in or learn about political activities</i>	0.73
<i>Start or maintain your own business</i>	0.66
<i>Online chatting</i>	0.52

As was witnessed in the region at large, the use of the computer for specific tasks varied among ethnic groups. People of color in general, and Latinos in particular, place a higher

value on the use of the computer for educational purposes or homework, as compared to whites. For Latinos, educational purposes or homework was the most important computer task. African-Americans and Asians/Pacific Islanders also felt that the computer was important for work-related tasks at a higher rate than other ethnic groups.

Importance of Tasks by Ethnicity San Diego, 2004				
<i>Task:</i>	White	African American	Latino	Asian/Pacific Islander
<i>Email</i>	1.65	1.52	1.42	1.90
<i>Online Chatting</i>	-0.39	-0.30	-0.51	0.03
<i>Getting Health or Medical Information</i>	0.52	0.33	0.64	0.93
<i>Managing Your Finances</i>	0.51	0.46	0.28	0.92
<i>Keeping Up to Date on Current Events</i>	0.68	0.44	0.86	1.12
<i>Entertainment or Sports</i>	0.24	0.48	0.47	0.65
<i>Start or Maintain Your Own Business</i>	-0.27	0.07	0.00	0.07
<i>Create Graphics</i>	0.16	0.07	-0.08	0.87
<i>Gather Information About Products and Services</i>	0.98	0.75	0.80	0.85
<i>Purchase Products or Services</i>	0.62	0.18	0.43	0.83
<i>Search for Jobs or Training</i>	0.04	0.52	0.56	0.85
<i>Do Work Related Tasks</i>	0.84	1.07	0.85	1.14
<i>Gather Information about Hobbies and Personal Interests</i>	0.94	0.82	0.92	2.05
<i>Find Information about Laws and Policies that Affect You</i>	0.26	0.64	0.75	0.98
<i>Travel Information and Arrangements</i>	1.10	0.86	1.09	1.18
<i>Educational Purposes or Homework</i>	0.70	1.04	1.53	1.42
<i>Participate in or Learn About Community Events</i>	0.30	0.07	0.56	0.41
<i>Participate in or Learn About Political Activities</i>	0.11	0.18	0.13	0.36

Respondents in the lowest income brackets demonstrate increased interest in certain tasks as compared to respondents in the higher income brackets:

- Health or medical information
- Educational purposes or homework
- Participate in or learn about political activities

It is also notable that use of the computer to search for jobs or training was particularly important for respondents in the \$20,000 – 34,999 income bracket. When respondents were asked whether or not computers had a positive impact on their lives, 88% of San Diego residents responded “Yes.”

Importance of Specific Tasks by Income San Diego, 2004						
<i>Income</i>	<i>Under \$20k</i>	<i>\$20k-\$34,999</i>	<i>\$35k-\$49,999</i>	<i>\$50k-\$74,999</i>	<i>\$75k-\$99,999</i>	<i>\$100k+</i>
<i>Email</i>	1.56	1.54	1.43	1.76	1.68	1.69
<i>Online Chatting</i>	-0.28	-0.25	-0.38	-0.06	-0.64	-0.03
<i>Getting Health or Medical Information</i>	1.16	0.78	0.40	0.73	0.30	0.48
<i>Managing Your Finances</i>	0.09	0.53	0.46	0.67	0.43	0.92
<i>Keeping Up to Date on Current Events</i>	0.36	1.00	0.79	0.84	0.80	0.90
<i>Entertainment or Sports</i>	0.58	0.57	0.47	0.35	0.26	0.48
<i>Start or Maintain Your Own Business</i>	-0.24	-0.10	-0.25	0.12	-0.50	0.11
<i>Create Graphics</i>	0.04	0.49	0.12	0.50	0.28	0.24
<i>Gather Information About Products and Services</i>	0.71	0.97	0.44	1.28	0.72	1.29
<i>Purchase Products or Services</i>	0.50	0.20	0.37	1.07	0.51	0.92
<i>Search for Jobs or Training</i>	0.27	0.62	0.17	0.47	0.32	0.25
<i>Do Work Related Tasks</i>	0.71	0.81	0.91	1.02	0.91	1.10
<i>Gather Information about Hobbies and Personal Interests</i>	0.96	1.07	0.77	1.26	1.06	1.00
<i>Find Information about Laws and Policies that Affect You</i>	0.67	0.70	0.45	0.86	0.15	0.57
<i>Travel Information and Arrangements</i>	1.05	0.63	1.00	1.50	1.28	1.44
<i>Educational Purposes or Homework</i>	1.44	1.29	1.08	1.12	0.72	0.87
<i>Participate in or Learn About Community Events</i>	0.28	0.54	0.40	0.53	-0.11	0.34
<i>Participate in or Learn About Political Activities</i>	0.43	0.42	-0.06	0.16	0.06	0.15

Reasons for Not Owning a Computer

Cost was the main reason cited by San Diego respondents in 2004 for not owning a computer at home. When asked a similar question in 2000, 41% of survey respondents stated that the main reason for not owning a computer was that they had “No need for computers.” Cost ranked second with 31% of respondents claiming it as the most important reason for not owning a computer.

As seen in other graphs throughout this report, a mean score range was utilized to gauge the importance of reasons for not owning a computer. A score of 0 indicates no importance, whereas a score of 2 indicates high importance.

Reasons for Not Owning a Computer San Diego 2004	
	Overall
<i>Cost</i>	1.10
<i>Existing Outside Access</i>	1.02
<i>Don't Know How to Use</i>	0.77
<i>Learning How to Use is Difficult</i>	0.59
<i>Not Enough Time</i>	0.80
<i>Don't Know What I Would Use it For</i>	0.73
<i>Don't Want Children to Have Home Access</i>	0.60
Legend: Importance	
<i>Measure:</i>	<i>Value:</i>
Not at all Important	+0
Somewhat Important	+1
Very Important	+2

There was minimal variation in responses among ethnic groups, with one exception. Cost was a significant reason for not owning a computer among Latinos and Asians/Pacific Islanders.

Reasons for Not Owning a Computer by Ethnicity San Diego, 2004				
	White	African American	Latino	Asian/Pacific Islander
<i>Cost</i>	0.81	0.50	1.30	1.57
<i>Existing Outside Access</i>	1.07	0.75	0.92	2.00
<i>Don't Know How to Use</i>	0.61	0.50	0.77	1.00
<i>Learning How to Use is Difficult</i>	0.48	1.00	0.50	1.00
<i>Not Enough Time</i>	0.74	1.00	0.59	0.38
<i>Don't Know What I Would Use it For</i>	0.59	0.50	0.63	2.00
<i>Don't Want Children to Have Home Access</i>	0.39	0.50	0.62	1.00

As one might guess, the importance of cost as a reason for not owning a computer decreases as income increases. It is notable that for respondents in the two lowest income groups, not knowing what to use a computer for is an important reason for not owning a computer. For respondents in the lowest income group, it was the most important reason. This is significant because it demonstrates that lower income individuals in San Diego are at a significant disadvantage if they do not already own a computer or possess computer skills.

Reasons for Not Owning a Computer by Income San Diego, 2004						
<i>Reason</i>	<i>Under \$20k</i>	<i>\$20k to \$34,999</i>	<i>\$35k to \$49,999</i>	<i>\$50k to \$74,999</i>	<i>\$75k to \$99,999</i>	<i>\$100k+</i>
<i>Cost</i>	1.33	1.08	0.89	n/a	0.25	n/a
<i>Existing Outside Access</i>	1.22	1.15	0.89	n/a	n/a	0.00
<i>Don't Know How to Use</i>	1.22	0.56	0.33	1.22	0.00	0.00
<i>Learning How to Use is Difficult</i>	0.89	0.46	0.33	1.11	0.50	0.00
<i>Not Enough Time</i>	0.67	0.96	0.44	0.56	0.25	n/a
<i>Don't Know What I Would Use it For</i>	1.40	0.88	0.22	0.78	0.00	n/a
<i>Don't Want Children to Have Home Access</i>	0.78	0.52	0.44	0.67	0.00	n/a

Attitudes towards computers

A mean score from -2 to +2 was utilized to gauge the degree to which San Diegans agreed with negative and positive statements about computers and technology. -2 represented complete disagreement with the statement, 0 indifference, and +2 complete agreement with the statement.

Most San Diegans have positive attitudes toward computers and technology. When asked about their level of agreement with the positive statement, "It is important for school age children to know how to use computers," San Diegans heavily agreed.

Also, most respondents indicated that computers are a part of their everyday life as witnessed in their disagreement with the statement, "Most people I know do not use computers."

Agreement with Statements San Diego, 2004	
<i>We have come to rely too much on technology and science</i>	0.16
<i>Most people I know do not use computers</i>	-1.17
<i>Modern technology presents a threat to privacy and freedom</i>	0.18
<i>It is important for school age children to know how to use computers</i>	1.76

Certain trends in attitudes toward computers are evident among people of color as compared to whites. As compared to whites, people of color are more likely to think that:

- We have come to rely too much on technology and science
- Modern technology presents a threat to privacy and freedom

In addition, African-Americans are the group that most closely identifies with the statement “most people I know do not use computers.”

Agreement With Statements by Ethnicity San Diego, 2004				
	<i>White</i>	<i>African American</i>	<i>Latino</i>	<i>Asian/Pacific Islander</i>
<i>We have come to rely too much on technology and science</i>	-0.19	0.41	0.36	0.90
<i>Most people I know do not use computers</i>	-1.50	-0.70	-1.19	-0.92
<i>Modern technology presents a threat to privacy and freedom</i>	-0.09	0.47	0.32	0.16
<i>It is important for school age children to know how to use computers</i>	1.79	1.69	1.74	1.90

Respondents in lower income brackets may have a slight distrust of computer technology as compared with respondents in higher income brackets, based on their higher degrees of agreement with the statements “we have come to rely too much on technology and science,” and “modern technology presents a threat to privacy and freedom.”

Agreement With Statements by Income San Diego, 2004						
	<i>Under \$20k</i>	<i>\$20k to \$34,999</i>	<i>\$35k to \$49,999</i>	<i>\$50k to \$74,999</i>	<i>\$75k to \$99,999</i>	<i>\$100k+</i>
<i>We have come to rely too much on technology and science</i>	0.69	0.45	0.16	0.17	0.23	-0.51
<i>Most people I know do not use computers</i>	0.86	-0.90	-1.40	1.15	-1.44	-1.65
<i>Modern technology presents a threat to privacy and freedom</i>	0.57	0.29	0.11	0.00	-0.10	-0.21
<i>It is important for school age children to know how to use computers</i>	1.68	1.77	1.82	1.80	1.96	1.92

ANALYSIS OF LOCAL GOVERNMENT DIGITAL DIVIDE INTERVENTION ACTIVITIES AND RECOMMENDATIONS

The following recommendations for the Science and Technology Commission to consider are based on a review of local governments that have engaged in digital divide intervention activities, and potential areas for action discussed in previous meetings of the Digital Inclusion Workgroup of the Science and Technology Commission.

Recommended Activities

Facilitate free wireless Internet access citywide.

Free citywide wireless Internet access is an activity that an increasing number of city governments are becoming involved in throughout the country. Free wireless Internet access is already available in San Diego through community-based and private projects in Barrio Logan, City Heights, Golden Hill, and Sherman Heights, and should be expanded throughout the city. Wireless Internet access in Barrio Logan and City Heights was made possible through funding from the Waitt Family Foundation, and was established by the following community organizations: City Heights Community Technology Center, San Diego Futures Foundation, and the MAAC Project. In Golden Hill and Sherman Heights, wireless access was established by an organization named SoCal Free Net. According to SoCal Free Net, early stage networks have also been deployed in Ocean Beach, Carmel Valley, and Clairemont Mesa.

Models for free wireless Internet access include community-based projects in Chicago and Los Angeles, and city-initiated projects in Philadelphia and San Francisco. Wireless Philadelphia appears to be the citywide wireless network that is the farthest along, although it is also only in the planning stages. In 2004, the Mayor of Philadelphia appointed a Wireless Philadelphia Executive Committee to guide the planning of the initiative, and Love Park was named as the initiative's first wireless hot spot. It is anticipated that it will cost the City of Philadelphia \$7 to 10 million to establish the citywide wireless network. This does not include maintenance costs. It is unclear exactly how the initiative will be funded by the City, but the Executive Committee is looking into public grants, industry donations/sponsorships, strategic partnerships, collaborations, and foundations.

Support local community technology efforts and linkages between community technology centers (CTCs), libraries, and the city's community service centers.

Cross-promote CTCs' and libraries' computer access and training programs.

- In previous meetings of the Digital Inclusion Workgroup (DIWG), potential partnerships between the libraries and existing CTCs were often discussed. The San Diego Community Technology Coalition is currently working to solidify such partnerships. The DIWG and the Science and Technology Commission in general should encourage and monitor the progress of these partnerships.
- Provide information on CTCs' and the libraries' computer access and training programs at community service centers.

The City of San Diego's community service centers represent an opportunity to help city residents locate computer facilities and training at the libraries and community technology centers. In addition, an extensive map of CTCs within San Diego County currently exists on the San Diego Community Technology Coalition website. This map should be promoted at

the community service centers, together with information on what, when, and where training is available at the libraries and CTCs.

- Explore a partnership with the San Diego Futures Foundation to utilize its www.sdcommunities.net portal to provide information on City services and digital inclusion efforts.

Another feature that successful city-led digital divide initiatives have in common is an online presence that describes the initiative to the community. The San Diego Futures Foundation already has an existing community portal, www.sdcommunities.net. The City should work with the San Diego Futures Foundation to utilize the portal to publicize future DIWG activities as well as City services that are available to the public.

- Fund San Diego Community Technology Coalition to develop the above partnerships and facilitate relationships between the City of San Diego and organizations involved in community technology in San Diego.

The San Diego Community Technology Coalition is an association of community technology professionals within San Diego. The Coalition puts on quarterly meetings, workshops, and brown-bag presentations with the purpose of supporting community technology through networking and resource sharing. The Coalition also has an active listserve with over one hundred subscribers. The Coalition is well positioned as a potential liaison between the City of San Diego and organizations involved in community technology efforts, and has been represented on the DIWG in the past.

Continue to convene the Digital Inclusion Working Group (DIWG) as a high level forum for community technology issues and awareness, and provide full-time staff support.

Perhaps one of the greatest accomplishments of the DIWG to date has been its ability to convene a wide array of stakeholders, who may have otherwise never met, to discuss digital divide-related issues. The DIWG has included representatives from industry, regional organizations such as the San Diego Regional EDC and the RTA, the City's public libraries, public schools, universities, and community organizations. This is an important function of the DIWG. Many of the preliminary DIWG meetings were for the purpose of fact-finding, but this body would serve as an excellent advisory or oversight committee to support whatever digital divide intervention activities the City decides to undertake.

A full-time staff person to provide support to the activities of the DIWG would also strengthen potential intervention activities. Most successful citywide initiatives (including Seattle, Durham, and Atlanta) have had full-time staff persons dedicated solely to digital divide-related initiatives. Thus far, the City has provided staff support to the DIWG from its Community and Economic Development Services Department on an as-needed basis, which has been extremely valuable. However, full-time staff support is crucial to the success of any city-backed initiatives.

Incorporate technology access and training in existing CDBG funding guidelines.

The City of San Diego has received Community Development Block Grant (CDBG) funding from the United States Department of Housing and Urban Development since 1975. The City distributes a portion of this funding in the form of grants to community organizations through an annual solicitation. The grants are designated to fund projects that accomplish one or more of three national CDBG objectives: (1) to benefit low- and moderate- income

persons, (2) prevent or eliminate slums or blight, or (3) meet other urgent community development needs.

In recognition of the fact that limited computer access and literacy is a community development and particularly a workforce development issue, the City should give priority to those CDBG applications whose goals include technology literacy training for the population it serves.

Funding Mechanisms

Cable franchise renewal agreements

Successful city-led digital divide intervention activities have relied heavily on the renewal of cable franchise agreements as a major source of funding. In Atlanta, the city's cable franchise renewal agreement provided \$8.1 million in funding over five years solely for community technology projects. When cable franchises are up for renewal, public access television channels are examples of common concessions provided by the cable company as part of the franchise renewal agreement. But by law, the city can assess a fee of up to five percent of the cable company's gross revenue. If successfully negotiated by the city, this fee could potentially fund community technology efforts, as has been done in other cities. Free, reduced, or volume-discounted rates for high speed Internet access for libraries and CTCs can also be negotiated as well.

The first step would be to determine when the current cable franchise agreement is set to expire. Next, several organizations exist to provide assistance with the cable franchise renewal agreement negotiation process, such as The Children's Partnership and the Center for Digital Democracy. The Children's Partnership has researched cable franchise renewal agreements in various cities throughout the country and has prepared information on what policymakers and advocates can ask for, as well as suggested steps. The Center for Digital Democracy has experience providing technical assistance to city governments throughout the cable franchise renewal agreement negotiation process.

Corporate contributions

Most city-led digital divide intervention efforts were also able to leverage additional outside funding to support its activities. In most cities, project funding that did not result from cable franchise renewal agreements came from corporate donations or sponsorships. The City of Durham, where \$100,000 was used to leverage \$1.2 million in funding for its City-wide Technology Enrichment Program provides a particularly compelling example. In this case, the initiative's executive director was able to persuade local businesses to donate cash and equipment by focusing his sales pitch on how the effort would help their businesses rather than presenting the effort as a community service. The City should look to the abundance of technology companies throughout San Diego, many of which have corporate philanthropy initiatives, as a source of potential funding.

Case Studies

Atlanta – Atlanta Community Technology Initiative

In 1999, the City of Atlanta created the Atlanta Community Technology Initiative. This Initiative:

- Established a Mayor's Office of Community Technology
- Opened thirteen Community Cyber Centers and seven kiosks
- Created a Virtual City Hall and Virtual Community Portal
- Undertook a community needs and resources assessment that involved leaders from the community, business, and academia.

The initiative sought to bring computer and Internet access and training to residents of inner-city Atlanta, specifically within the city's Empowerment Zone and nearby areas. The initiative was initially funded by MediaOne/AT&T Broadband, who contributed \$8.1 million in startup funding as part of its cable franchise renewal agreement with the City of Atlanta.

Mayor Bill Campbell, who spearheaded the initiative, established the Mayor's Office of Community Technology (MOCT) in 1999, staffed by seven employees. Shortly thereafter, the mayor formed three groups to assess the community's needs and resources with regard to the digital divide:

- a Blue Ribbon Committee comprised of twenty-five leaders from business and academic institutions within Atlanta
- an Atlanta Community Technology Initiative Advisory Committee comprised of organizations with experience in technology and low income communities
- a development team tasked with research and preparation of a strategic plan.

The Initiative proceeded to open thirteen Community Cyber Centers, seven kiosks, and one Cyber Mobile Unit throughout Atlanta. The centers and kiosks provided computers, Internet access, and both self-paced and guided computer training for Atlanta residents. The centers were housed mainly at facilities provided by the city's Department of Parks and Recreation, and were funded through corporate sponsorships. Corporate sponsorships for each center began at \$150,000 per year. The Department of Parks and Recreation also provided transportation for residents to and from the centers after dark. The Initiative established partnerships with colleges and universities within Atlanta, whereby students staffed the centers as volunteers.

The Initiative also created Virtual Community Portals. Each Community Cyber Center has its own online community portal where residents can find information about the city's social services, public safety, emergency preparedness, employment and business opportunities, entertainment, recreation, schools, and churches. The portals also have community calendars. In addition, at www.atlantacommunitytech.org, residents can find information about classes being offered at each of the Community Cyber Centers.

Finally, the Initiative holds an annual Technology Summit that showcases the Initiative's successes and continues dialogue about the Initiative's efforts in general.

Lessons that the City of San Diego can learn from the Atlanta Community Technology Initiative include:

- Use cable franchise renewal agreements as a source of major funding
- Involve the community, academia, and business leaders in program design

- Make use of existing resources (ie Atlanta's Department of Parks and Recreation as a source of facilities)
- Establish measurable goals and guidelines from the outset and evaluate progress regularly
- Use increased technology access and awareness as an opportunity to increase interaction between the City and its residents
- Designate staff solely for community technology efforts

It should also be noted that Atlanta's success in securing corporate sponsorships to fund its initiative may have been due to the political climate at the time of its inception. According to Karen Chandler of the Community Technology Centers' Network (CTCNet) in 2000, corporations may have been more willing to contribute to digital divide-related efforts because the White House, headed by President Clinton at the time, paid a significant amount of attention to the digital divide. Ever since, the Bush administration has not made the digital divide a priority at all, and media attention to the issue has dwindled as well. Accordingly, the number of corporate foundations and other philanthropic organizations that have set aside funding specifically for digital divide-related efforts appears to have decreased significantly.

Similar city government-led initiatives to open new community technology centers have also occurred in Cleveland, Ohio, and Durham, North Carolina.

Seattle – Seattle Community Technology Program

The City of Seattle began its Community Technology Program in 1997, as a part of its Department of Information Technology. The program currently consists of:

- A Technology Matching Fund program

The City provides funding to CTC applicants through this program on an annual basis. The funding is designated for projects that help to close the digital divide, and approximately \$138,000 in grant funding per year is available from this fund.

- A Techmap that allows website visitors to locate a CTC within Seattle
- Regular assessment of information technology indicators within the city

In 2002, the City of Seattle surveyed its residents to assess the health of the community in terms of technology access and literacy to produce *Information Technology Indicators for a Healthy Community*. The report is similar to the RTA's 2001 and 2004 digital divide studies, but in an indicator format. The City surveyed its residents again in 2004, and will soon release its results.

- Information Age Curriculum, an awareness campaign seeking to instill the importance of technology
- Community capacity building

The City of Seattle is unique in that it is the only city we analyzed that actively supports the use of technology within nonprofit organizations, particularly in terms of nonprofit capacity building and training. As part of its cable franchise renewal agreement, it secured 500 high speed cable modem Internet connections from AT&T for nonprofit organizations. The City also provides free web hosting and listservs,

and free surplus computers to nonprofit organizations. In addition, the City also studied and released a report on CTC sustainability in Seattle.

- Financial support of Puget Sound Alliance for Community Technology

Digital divide intervention activities within the City of Seattle are housed within its Department of Information Technology. The department's Community Technology Program has three staff persons: a program manager, a project coordinator, and a community tech support and listserv manager. The City began its community technology work in 1998 when it found Seattle's thirty-five existing CTCs to be in a state of disrepair. The City obtained funding from the U.S. Department of Education, corporations in the Puget Sound area, and its cable franchise renewal agreement.

The City of Seattle example is significant for its recognition of the importance of working with and supporting community alliances, such as the Puget Sound Alliance for Community Technology (PSACT). The PSACT was heavily involved in the refurbishing of CTCs initiated by the City of Seattle, and continues to be a key player in digital divide intervention activities in the region.

Most cities that have initiated digital divide-related efforts focused much of their attention on opening (Atlanta, Durham, Cleveland) or upgrading (Seattle) CTCs. In San Diego, numerous CTCs already exist, thanks in large part to PowerUP. This program, funded by several technology companies, was launched nationally in 2001, and provided the hardware and infrastructure for community centers to develop public access computer labs. However PowerUP ended in 2003, and no large, organized effort has replaced it. The City of San Diego would be advised to recognize the importance of, and actively support, the CTCs as instruments for spreading technology awareness, access, and training throughout the community.

Resources and Assistance

The Children's Partnership

Resources for cable franchise renewal agreements, extensive information on digital divide intervention activities initiated by other cities throughout the country

1351 3rd Street Promenade
Suite 206
Santa Monica, CA 90401
(310) 260-1220
<http://www.techpolicybank.org>
Contact: James Lau

Center for Digital Democracy

Technical assistance and consulting for city governments on the cable franchise renewal agreement negotiation process

1718 Connecticut Ave. NW
Washington, DC 20009
(202) 986-2220
<http://www.democraticmedia.org>
Contact: Gary Larson

CONCLUSION: THE OPPORTUNITY

Members of the Science and Technology Commission requested that the RTA arrive at an opportunity cost measuring the cost to the City of San Diego if it does not intervene in digital divide activities. It is not a common practice for a region or municipality to estimate such an opportunity cost. As a phenomenon such as the digital divide is extremely amorphous and complex, it is difficult to demonstrate direct causality, much less quantify it. In *Joint Venture's Workforce Study* in 1999, Joint Venture Silicon Valley estimated "incremental hiring and opportunity costs" to high tech industry associated with the region's workforce gap at \$3 to 4 billion. In a special analysis on Silicon Valley's digital divide in its *2000 Index of the Silicon Valley*, Joint Venture Silicon Valley again referenced those costs, but did not directly or indirectly relate them to the digital divide. In both cases, Joint Venture Silicon Valley did not arrive at an opportunity cost associated with not acting to halt the digital divide.

The RTA therefore cannot directly and with certainty calculate an opportunity cost for the City's non-intervention in the digital divide. However, the RTA can attempt to quantify, in wages, the impact associated with segments of the population lacking computer literacy. This can be estimated by examining a population's inability to enter into cluster occupations that require computer skills. This analysis also underscores the importance of cluster jobs in relation to the living wage defined by the San Diego Workforce Partnership and SourcePoint in *A Path to Prosperity*, and compare average wage levels between those cluster jobs that require computer skills, and those that do not.

For the clusters analyzed in the analysis of labor demand section earlier in this report (business services, communications, defense and transportation manufacturing, medical services, and software and computer services), the average entry-level annual wage was \$26,237 in 2004. According to SANDAG's Data Warehouse, the city of San Diego has 1,294,032 residents. If, as our survey found, 6.5% of the city's population is uncomfortable with or has no experience with computers, this amounts to 84,112 residents that can conservatively be considered computer illiterate, and would therefore be unable to enter into employment that requires computer skills. If we examine the 11.2% of the city's population who are not comfortable or have no experience with basic computer tasks, the number of residents that are not computer literate jumps to 144,931.

Employment in the selected clusters is forecasted to comprise 16.6% of total regional civilian employment in 2010.⁶ Assuming only 16.6% of the 84,112 residents might enter employment in the clusters selected, the number of computer illiterate residents who could potentially enter selected cluster employment if they had computer skills falls to 13,974. In wages, this amounts to \$366,635,838 annually, based on the 13,974 city of San Diego residents that would not be able to enter into cluster occupations that require computer skills.

It is also important to remember that the clusters analyzed typically provide high-wage employment. As demonstrated in the labor demand analysis earlier in this report, computer skills are essential to a vast majority of these occupations. There are occupations within other clusters, such as visitor services, that do not require computer skills.⁷ However, such occupations pay wages that fall below the region's living wage. The living wage is defined in *A Path to Prosperity* as the hourly wage required in order for a single worker to be economically self-sufficient, based on costs for rent and utilities, food, transportation, health

⁶ SANDAG 2030 Regionwide Forecast

⁷ An analysis of five growth occupations within the visitor services cluster revealed that three of the occupations required computer skills, while two did not.

care, clothing and personal items, and taxes. In 2004, the region's living wage was \$12.34 per hour.⁸ The average hourly wage within the visitor services cluster was \$10.00 per hour. In contrast, the average hourly wage within the five clusters analyzed is \$36.00 per hour.

This discrepancy in wages is significant because it signifies that those cluster occupations that require computer skills tend to pay wages that are substantially higher than what is required to maintain basic self-sufficiency, and that those cluster occupations that do not require computer skills do not even provide a wage that guarantees basic self-sufficiency.

Furthermore, this discrepancy in wages is significant because any wages earned above and beyond the living wage can be considered an individual's disposable income. There is a link between the high wage employment provided by these clusters and the City's ability to generate revenue, due to the additional disposable income that such high-wage employment generates.

To the City of San Diego, this disposable income signifies potential revenue by way of contributions to sales tax. If housing affordability, as a quality of life issue, is factored in to this discussion as well, anecdotal evidence supports the fact that future property tax revenues will be driven by the ability of the City's residents to qualify for the kinds of jobs that require computer literacy.

Anecdotal evidence also supports concerns that eGovernment programs cannot be fully launched in a community in which a significant percentage of citizens would be automatically excluded from receiving services. Unfortunately, there are no hard facts available that can quantify the cost to the City of maintaining redundant services, rather than migrating to a more fully web-enabled system of dispensing information and support services.

Nevertheless, by choosing to get more actively engaged in addressing issues of computer literacy and internet access, the City could gain valuable revenue opportunities. If only a small percentage of the more than 140,000 citizens who are currently not computer literate could gain the skills to more actively participate in the economy of the 21st Century, our City's economy would be stronger.

⁸ This figure is based on the \$11.58/per hour living wage estimated in *A Path to Prosperity*, adjusted for inflation.

METHODOLOGY

On behalf of the RTA, Godbe Research and Analysis conducted a comprehensive survey of 1,000 San Diego County residents. The survey was designed by the RTA and Godbe Research and Analysis, and was based on the survey used in the RTA's 2001 digital divide study, Mapping a Future for Digital Connections, a Study of the Digital Divide in San Diego County. The survey instrument from the RTA's 2001 digital divide study was modeled upon the survey conducted by the U.S. Department of Commerce's National Telecommunications and Information Administration, which has performed four studies of the digital divide nationally. In designing the 2004 survey, the RTA borrowed from the City of Seattle's Information Technology Indicators Residential Survey, released in May 2002.

Godbe Research and Analysis conducted 1,000 telephone interviews among San Diego County residents 18 years of age or older, representing a universe of 2,200,000 residents. Interviews were conducted from November 25 through December 4, 2003.

Once collected, the survey data were compared with SANDAG and California Department of Finance projections based on extrapolations from Census 2000 data to examine possible differences between the sample and the population of adult residents (18 years and older) within the County of San Diego on major demographic variables. After examining the dimensions of geographic region, gender, ethnicity, and age, the data were weighted to accurately represent the target population.

For the purposes of the survey and its analysis, San Diego County was divided into four geographic sub-regions as shown below: Data for this report was based on San Diego City responses.

East County	91901 91903 91905 91906 91916 91917 91931 91934 91935 91941 91942 91943 91944 91945 91946 91948 91962 91963 91976 91977 91978 91979 92003 92004 92019 92020 92021 92022 92025 92026 92027 92028 92029 92030 92033 92036 92040 92046 92059 92060 92061 92064 92065 92066 92070 92071 92072 92074 92082 92086 92088 92090
North County Coastal	92007 92008 92009 92013 92014 92018 92023 92024 92049 92051 92052 92054 92055 92056 92057 92058 92067 92068 92069 92075 92078 92079 92083 92084 92085 92091 92096
San Diego City	92101 92102 92103 92104 92105 92106 92107 92108 92109 92110 92111 92112 92113 92114 92115 92116 92117 92118 92119 92120 92121 92122 92123 92124 92126 92127 92128 92129 92130 92131 92132 92133 92134 92136 92137 92138 92139 92140 92142 92145 92147 92149 92150 92152 92153 92154 92155 92159 92160 92161 92162 92163 92164 92165 92166 92167 92168 92169 92170 92171 92172 92173 92174 92175 92176 92177 92179 92182 92184 92186 92187 92190 92191 92192 92193 92194 92195 92196 92197 92198 92199 92037 92038 92039 92092 92093 92143 92173
South County	91902 91908 91909 91910 91911 91912 91913 91914 91915 91921 91932 91933 91947 91950 91951 91980 91987 92118 92135 92178

For analyses involving computer literacy that are included in this report, data is from survey responses to a survey question that asked if the respondent was comfortable or uncomfortable with using the computer for specific tasks, and asked to what degree he or she is comfortable or uncomfortable. In its analysis of the survey data, the RTA classified each task in one of the following literacy categories:

- Computer general
- Internet general
- Computer basic
- Computer advanced
- Internet basic
- Internet advanced

The tasks were grouped in the following way, based on tasks and classifications used in the City of Seattle's *Information Technology Indicators for a Healthy Community*:

Computer General

Using a computer in general

Internet General

Using the Internet in general

Computer Basic

Saving a file

Opening a saved file

Using a word processing program

Computer Advanced

Installing new software

Using a spreadsheet program

Creating a flyer that includes graphics

Setting up a new computer

Internet Basic

Sending an e-mail message

Replying to an e-mail message

Finding and retrieving information on the web

Downloading files from the Internet

Internet Advanced

Signing up and removing oneself from an e-mail list

Setting up a new Internet connection

LIST OF APPENDICES

APPENDIX A	Projected Regional Cluster Employment 2004 and 2030
APPENDIX B	Works Cited

APPENDIX A

PROJECTED REGIONAL CLUSTER EMPLOYMENT 2004 & 2030

	<u>2004</u>	<u>2030</u>
Biomedical Products	6,023	4,745
Biotechnology and Pharmaceuticals	26,822	32,924
Business Services	100,379	149,185
Communications	14,617	19,807
Computer and Electronics Manufacturing	23,033	30,673
Defense and Transportation Manufacturing	15,543	23,042
Entertainment and Amusement	19,180	25,610
Environmental Technology	3,545	1,945
Financial Services	13,570	23,350
Fruits and Vegetables	3,347	3,020

APPENDIX B

WORKS CITED

Occupational Outlook

Cluster reports – 5 + visitor services

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